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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,144	01/17/2002	Khosro Shamsaifar	PARA 49784	1066
27512	7590	03/01/2004	EXAMINER	
WILLIAM J. TUCKER 8650 SOUTHWESTERN BLVD. #2825 DALLAS, TX 75206			GLENN, KIMBERLY E	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/051,144

**Applicant(s)**

SHAMSAIFAR ET AL.

**Examiner**

Kimberly E Glenn

**Art Unit**

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6,7 and 12-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 6 7 12-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4,6,7, 13-15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins US Patent 4,418,324 in view of Liang et al US Patent 6,597,265.

The primary reference Higgins teaches a filter comprising a input 18, an output 20, a plurality of conductive strips (resonators) 16A - 16D, a plurality of variable capacitors 22A 22B 24A 24B and a transmission lines 22C and 24C for coupling non adjacent resonators. The transmission lines are connected to the resonators through capacitors 22A 22B 24A 24B. Higgins further teaches in figure 3 that the filter further contains a substrate 32 and ground plane 28. The conductive strips are positioned parallel to the substrate.

Thus, Higgins is shown to teach all the limitations of the claims with the exceptions of the plurality of variable (Tunable) capacitors comprising a first electrode: a tunable dielectric film positioned on the first electrode and a second electrode positioned on a surface of the tunable dielectric film opposite the first electrode and wherein for operation at frequencies ranging from 1.0 GHZ to 10 GHz. the loss tangent

would range from 0.001 to 0.005: for operation at frequencies ranging from 10 GHz to 20 GHz, the loss tangent would range from 0.005 to 0.41; for operation at frequencies ranging from 20 GHz to 30 GHz, the loss tangent would range from 0.01 to 0.02, the tunable dielectric film comprising barium strontium titanate or composites of barium strontium titanate, which are voltage tunable dielectric material, the tunable capacitors comprising of a substrate, a tunable dielectric film positioned on the substrate and first and second electrode positioned on a surface of the tunable dielectric film opposite the substrate, the first and second electrodes being separated to form a gap, and the tunable dielectric film further comprising a non tunable component.

Liang et al teaches in figures 18 and 19 a tunable dielectric varactor 500, which comprises a tunable ferroelectric layer 506 is positioned adjacent to the top surface of the substrate. A pair of metal electrodes 508 and 510 are positioned on top of the ferroelectric layer. The tunable dielectric layer is preferably comprised of Barium-Strontium Titanate,  $\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$  (BSTO), where x can range from zero to one, or BSTO-composite ceramics. Examples of such BSTO composites include, but are not limited to: BSTO--MgO, BSTO— $\text{MgAl}_2\text{O}_4$ , BSTO- $\text{CaTiO}_3$ , BSTO-- $\text{MgTiO}_3$ , BSTO-- $\text{MgSrZrTiO}_6$ , and combinations thereof. A gap 22 of width g, is formed between the electrodes 18 and 20. Liang et al disclose that the ferroelectric layer of the varactor can be comprised of a Barium-Strontium Titanate,  $\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$  (BSTO), BSTO and various oxides, or a BSTO composite with various dopant materials added. All of these materials exhibit a low loss tangent. For the purposes of this description, for operation at frequencies ranging from about 1.0 GHz to about 10 GHz, the loss tangent would range

from about 0.001 to about 0.005. For operation at frequencies ranging from about 10 GHz to about 20 GHz, the loss tangent would range from about 0.005 to about 0.01. For operation at frequencies ranging from about 20 GHz to about 30 GHz, the loss tangent would range from about 0.01 to about 0.02. The tunable dielectric materials can also be combined with one or more non-tunable dielectric materials. (Column 8; line 40 through column 9; line 46)

One of ordinary skill in the art at the time of the invention would have found to obvious to replace the general variable capacitor of Higgins et al with tunable dielectric varactors of Liang et al.

The motivation for this modification would have been to provide capacitors that have higher Q factor as well as higher power handling. (Column 13, line 44-47)

Claims 3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view Liang et al as applied to claims 1, and 13-15 above, and further in view of Sogo et al US Patent 5,192,926. (Of record)

Thus Higgins and Liang et al are shown to teach all the limitations of the claim with the exception of the means for coupling non adjacent resonators comprises a series connection of a additional tunable capacitor and a conductor. (See above rejection)

Sogo et al disclose dielectric filter having a bypass pattern shown in FIG. 8B comprising conductor with a capacitively coupled portion 10.

One of ordinary skill in the art at the time of the invention would have found it obvious to provide the filter of Higgins with a bypass pattern as taught by Sogo et al.

The motivation for is modification would have been to provide the filter of Higgins with attenuation poles. Sogo et al teaches that forming attenuation poles in the frequency characteristic curve of a filter having successively coupled resonance element in order to sharpen the curve or to eliminate specific frequency components such as leakage of a local oscillation frequency. (Column 1; lines 36-39 and column 3 lines 51-57)

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view Liang et al as applied to claims 1, and 13-15 above, and further in view of Leonard US Patent 3,602,848

Thus Higgins and Liang et al are shown to teach all the limitations of the claim with the exception of the input includes a first microstrip line having an end capacitively coupled to a first one of the resonators; and wherein the output includes a second microstrip line having an end capacitively coupled to a second one of the resonators. (See above rejection)

Leonard discloses an input capacitor C4 connected to the input resonator loop and an output capacitor C5 connected to the output resonator 3.

One of ordinary skill in the art at the time of the invention would have found to obvious to replace the tapped input and outputs of Higgins with the capacitive coupled input and output as taught by Leonard.

Thus the motivation for this modification would have been to provide the benefit of impedance matching means between the input device and the input resonator and the output resonator and a suitable utilization device.

***Response to Arguments***

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly E Glenn whose telephone number is (571)-272-1761. The examiner can normally be reached on Monday-Friday 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571)-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimberly E Glenn  
Examiner  
Art Unit 2817

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BENNY T. LEE  
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